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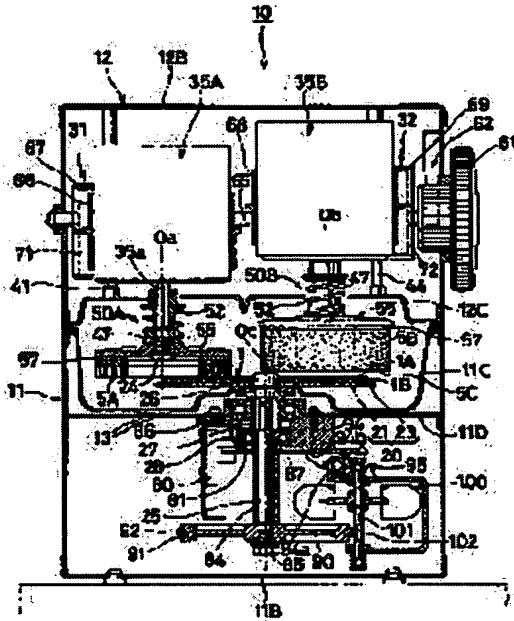
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(54) DISK CLEANER

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a disk cleaner which can adequately remove flaws or contamination on the disk without generating a defect such as wavering on the disk and assuring an improved finish.

SOLUTION: Polishing tools 5A, 5B comprising buff or the like are pushed against the surface to be polished 1A of a disk 1, these polishing tools 5a, 5B are rotated to polish the surface 1A to be polished, the rotating axial lines Oa, Ob of the polishing tools 5A, 5B are arranged perpendicular to the surface 1A to be polished and the disk 1 is rotated in one direction with a friction force between the polishing tools 5A, 5B and the surface 1A to be polished.



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CLAIMS

[Claim(s)]

[Claim 1] In the disk cleaner (10) press [cleaner] against the polished surface-ed (1A) of a disk (1) the polish implement (5A, 5B) which consists of a buff etc., rotates this polish implement (5A, 5B), and it is made to have said polished surface-ed (1A) polished At the time of polish of said disk (1), it is axis of rotation (it Oa(s)) of said polish implement (5A, 5B). The disk cleaner characterized by arranging Ob) perpendicularly to said polished surface-ed (1A), and making an one direction rotate said disk (1) according to the frictional force between said polish implements (5A, 5B) and said polished surfaces-ed (1A).

[Claim 2] Said one [at least] axis of rotation of said polish implement (5A, 5B) (it Oa(s)) Ob) is ****(ed) by the location which only a predetermined distance left in the direction of a path to axis of rotation (Oc) of said disk (1). The disk cleaner according to claim 1 characterized by trying to contact said a part of polish implement (5A, 5B) in said polished surface-ed (1A) of said disk (1).

[Claim 3] It is the disk cleaner according to claim 1 or 2 which is made into the bell shape at least on the other hand (5B), and is characterized by the thing of said polish implement for which he is trying to press the end face (5C) against the polished surface-ed (1A) of said disk (1).

[Claim 4] A disk cleaner given in claim 1 characterized by trying to be added in the direction which controls the rotation to said one direction of said disk (1) by the frictional force between said polish implements (5A, 5B) and said polished surfaces-ed (1A) on said disk (1) in a predetermined load thru/or any 1 term of 3.

[Claim 5] The disk cleaner according to claim 4 characterized by the fan (100) for carrying out suction exclusion being interlocked with rotation of the turntable (20) on which said disk (1) is laid, and trying to make him drive the shaving dregs of said disk (1), the powder of abrasives, etc. in order to add said load to said disk (1).

[Claim 6] A disk cleaner given in claim 1 characterized by enabling attachment and detachment of said polish implement (5A, 5B) in the vertical direction to said disk (1) thru/or any 1 term of 5.

[Claim 7] A disk cleaner given in claim 1 characterized by enabling it to adjust the contact pressure of said polish implement (5A, 5B) to said polished surface-ed (1A) thru/or any 1 term of 6.

[Claim 8] A disk cleaner given in claim 1 characterized by making the rotation diameter (Ds, Dt) of said polish implement (5A, 5B) larger than the radial width of face (Ls) of the field (1b) in said polished surface-ed (1A) of said disk (1) which should be ground thru/or any 1 term of 7.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] This invention relates to the disk cleaner used in order to remove a blemish, dirt, etc. with which the front face of disks, such as an optical disk as an information record medium or a magneto-optic disk, was stained, and relates to the thing it is made to have said polished surface-ed polished by pressing the polish implement which becomes the polished surface-ed of said disk from a buff etc. especially, and making it rotate.

[0002]

[Description of the Prior Art] When the front face, especially a recording surface are stained with a blemish, dirt, etc. in such a disk, it becomes impossible to read the recording information of the part stained with the blemish and dirt, and it becomes impossible appearance not only to worsen, but in recent years, to reproduce proper as sound and the object for images, or an information record medium for computers, although disks, such as a laser disc, CD (compact disk), CD-ROM, and DVD, have generally spread widely.

[0003] Therefore, manually, while taking time and effort and time amount, a blemish, dirt, etc. are fully unremovable in the former, although he is trying to remove a blemish, dirt, etc. of a disk manually using a cross etc. Especially in the place where disks, such as a used CD store and a library, are held in large quantities at, and are replaced frequently at, or a loan is performed, since a great effort will cleave to the blemish of a disk, or removal of dirt, enabling it not handicraft but to carry out mechanically and automatically is expected the blemish of this disk, and removal of dirt strongly.

[0004] The disk cleaner it is made to have said polished surface-ed polished is proposed by pressing the peripheral surface of the polish implement of the shape of a cylinder, such as a buff, against the polished surface-ed of the disk (recording surface), and rotating this polish implement, making the former, for example, JP,7-122038,A, rotate a disk in order to meet such a request.

[0005]

[Problem(s) to be Solved by the Invention] However, if it was in the disk cleaner of said proposal, there were the following problems. That is, the thing of the ** aforementioned proposal is made to press the peripheral surface of a polish implement against the polished surface-ed of a disk. Since in other words axis of rotation of said polish implement is arranged in parallel to said polished surface-ed at the time of polish, the same side periphery of a polish implement will always be pressed by the back end side to each part of a disk to the inner circumference part of a disk like the periphery part of a disk for example, the tip side of a polish implement. In this case, since the peripheral velocity of a periphery part is quicker than the peripheral velocity of the inner circumference part of a disk, if the cylindricity of a polish implement and parallelism with a polished surface-ed are not maintained correctly, it will become easy to produce a wave etc. on all the front faces of a disk.

[0006] ** In polishing a disk, it is desirable as a polish implement to prepare the thing for rough machinings (for blemish removal) and the thing for polishes (glazing, finishing). Since only the polish implement of a piece is pressed to one polished surface-ed of a disk, the thing of said proposal must exchange frequently the polish implement for blemish removal, and the polish implement for polishes, and is inconvenient.

[0007] ** In the thing of said proposal, the polish implement to a disk presses and the force cannot

be adjusted. Since a polish implement is worn out and deforms according to a polish activity, if it presses and the force cannot be adjusted, there is a possibility that necessary may press against a polish implement, the force may no longer be given, and it may become impossible to perform removal of a blemish or dirt proper.

** In the thing of said proposal, in case a disk is detached and attached, and in case exchange of a polish implement etc. is performed, the arm for disk maintenance must be made to rock in the direction of a path of a disk (horizontal direction) together with a disk drive motor, and handling is troublesome.

[0008] ** the contact surface of a polish implement [as opposed to / since the effective means against it for which it is necessary to maintain correctly the cylindricity of a polish implement and parallelism with a polished surface-ed as mentioned above nevertheless is not provided in the thing of said proposal / a disk] -- it cannot press and the force cannot polish dispersion and a disk to homogeneity. Without making a disk produce faults, such as a wave, the place which this invention was made in view of such a problem, and is made into the purpose is to offer the disk cleaner it enabled it to deal with easily while being able to remove the blemish and dirt with which the disk was stained proper and being able to change a polish implement easily.

[0009]

[Means for Solving the Problem] The disk cleaner concerning this invention that the aforementioned purpose should be attained The polish implement which consists of a buff etc. is fundamentally pressed against the polished surface-ed of a disk, this polish implement is rotated, and said polished surface-ed is polished. At the time of polish of said disk Axis of rotation of said polish implement is perpendicularly arranged to said polished surface-ed, and is characterized by making an one direction rotate said disk according to the frictional force between said polish implements and said polished surfaces-ed.

[0010] In the disk cleaner concerning this invention considered as such a configuration, the hit of each part of a polish implement to the polished surface-ed of a disk is equalized, consequently it is hard coming to generate partial wear in a polish implement, and the surface smoothness of the polished surface of a polish implement is maintained, and it is hard coming to generate faults, such as a wave, on a disk by arranging the axis of rotation of a polish implement perpendicularly to the polished surface-ed of a disk at the time of disk polish.

[0011] Moreover, since the force with a disk impossible for is not added while a result becomes beautiful as compared with the case where it is made to rotate said disk (turntable laid) compulsorily by a motor etc. by having made it rotate said disk according to the frictional force between said polish implements and said polished surfaces-ed, damage on the disk by the polish implement can also be prevented. Since the motor for rotating a disk in addition to it etc. is unnecessary, while being able to suppress the temperature rise of the disk by heat to generate, such as a motor, the bottom of miniaturization of equipment and reduction of equipment cost etc. is planned.

[0012] It is made to be added in the direction which controls rotation of the disk by the frictional force between said polish implements and said polished surfaces-ed on said disk in a predetermined load, and the fan for carrying out suction exclusion is interlocked with rotation of the turntable on which said disk is laid, and it is made to be made to drive the shaving dregs of said disk, the powder of abrasives, etc. in a more concrete desirable mode in the desirable mode of this invention in order to add said load to said disk.

[0013] Thus, by being carried out, predetermined frictional force can be easily given between said polish implements and polished surface-ed 1A of said disk, and it becomes possible to polish the polished surface-ed of said disk more effectively. Moreover, attachment and detachment of said polish implement in the vertical direction is enabled to said disk, and it enables it to adjust the contact pressure of said polish implement to said polished surface-ed further preferably with the disk cleaner concerning this invention.

[0014] Thereby, even if a polish implement wears out and deforms according to a polish activity, necessary can press against a polish implement, the force can be given, and removal of a blemish or dirt can be performed proper. In other desirable modes, at least one side of said polish implement is made into the bell shape, and the end face is pressed against the polished surface-ed of said disk. The force of making a predetermined hand of cut and hard flow rotating the disk by frictional force with

a polish implement is also mitigable by each part of the polish implement to a disk pressing, and the force, a hit, etc. becoming being easy to be equated, being able to polish the polished surface-ed of a disk much more equally, and considering as the bell shape further by this.

[0015] Moreover, it is made to **** in the location from which said one [at least] axis of rotation of said polish implement separated only a predetermined distance in the direction of a path to the axis of rotation of said disk in other desirable modes. It is made for said a part of polish implement to be contacted in said polished surface-ed of said disk, and the rotation diameter of said polish implement is made larger than the radial width of face of the field in said polished surface-ed of said disk which should be ground in a still more desirable mode. thereby -- a polish implement -- and -- or all the fields in the polished surface-ed of a disk that should be ground can be polished without requiring moving a disk in the direction of a path of a disk, and equipment structure and a device are simplified.

[0016]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained, referring to a drawing. Drawing 1 shows the appearance of 1 operation gestalt of the disk cleaner concerning this invention. The disk cleaner 10 of an illustration implementation gestalt is that which made 5 inches disks, such as CD, applicable to polish. The hinge region material 14 and 14 (refer to drawing 2 and drawing 4) prepared in the tooth-back side to the lower housing 11 and this lower housing 12 is used as the supporting point. It has the up housing 12 (drawing 2 shows the condition of having opened to max) it enabled it to open up. Said lower housing 11 So that what is necessary may be just to also refer to drawing 3 - drawing 5 and they may be understood Side **** 11A of a half-ellipse form, bottom plate 12C in which it becomes from bottom plate 11B, top-face plate 11C which has a trapezoid crevice, and internal maintenance plate 11D, and said up housing 12 has side **** 12A of a half-ellipse form, top-plate 12B, and a reverse trapezoid crevice -- since -- it has become.

[0017] In said lower housing 11, the revolving shaft 25 is perpendicularly held through the maintenance sleeve 28 at said internal maintenance plate 11D, and screwing immobilization of the spindle 26 is carried out at the upper limit section of this revolving shaft 25. This spindle 26 can be projected above said top-face plate 11C, it is closed, and attachment immobilization of the turntable 20 which consists of the substrate 21 and the rubber plate 23 which are laid in the condition that the disk (CD) 1 turned that recording surface (polished surface-ed) 1A up, and turned non-recording surface (label side) 1B to this spindle 26 down through the table attachment component 27 is carried out. Moreover, between said table attachment components 27 and said revolving shafts 25, the ball bearings 86 and 87 which can respond also to a thrust are arranged.

[0018] That the rotational frequency of said turntable 20 should be detected, the rotation detection disk 81 with which the slit of a predetermined number is formed by the equiangular distance is arranged really free [rotation], and the rotation detectors 80, such as a hole IC which detects the rotational frequency of this rotation detection disk 81, are arranged in the 1 side of this rotation detection disk 81 by the ball bearing 87 bottom of said bottom in said revolving shaft 25. Moreover, you are made for the tubed spacer 84 and the fan drive wheel 90 to be attached outside, and it binds tight and said rotation detection disk 81, said tubed spacer 84, and said fan drive wheel 90 are being fixed to said rotation detection disk 81 bottom in said revolving shaft 25 so that it may a revolving shaft 25 and really [said] rotate with the nut 85 you were made to screw in the lower limit section of said revolving shaft 25.

[0019] Outer fitting of the elastic ring 92 which consists of spring materials, such as rubber, is carried out to the periphery slot 91 of said fan drive wheel 90 in the condition that you were made to **** elastically. The fan 100 supported free [rotation] by the supporter material 95 held through ***** 94a at the attachment member 94 which fixed to said internal maintenance plate 11D is arranged in the side of this fan drive wheel 90. This fan 100 is for carrying out suction exclusion of the shaving dregs of said disk D, the powder of abrasives, etc. so that it may mention later, and the engagement section 102 like the serration gear tooth in which the thrust of non-vigor spring 94b arranged in the surroundings of said ***** 94a carries out a pressure welding is formed in the revolving shaft 101 so that said elastic ring 92 of said fan drive wheel 90 may eat away moderately.

[0020] Therefore, as for said fan 100, if said turntable 20 is made to rotate, the rotation driving force

will be transmitted to the revolving shaft 102 through said revolving shaft 25 and said fan drive wheel 90, and it will do a rotation drive. On the other hand, in said up housing 12, four guide rods 41, 42, 43, and 44 are perpendicularly arranged so that said top-plate 12B and said bottom plate 12C may be bridged. To said guide rods 41 and 42 located in left-hand side in drawing 3 among these guide rods 41-44 The supporting guide of the vertical sliding of the left-hand side sliding rise-and-fall member 31 containing GIADO motor 35A for carrying out the rotation drive of the polish implement 5A for blemish picking (rough machining) mentioned later is made possible. The supporting guide of the vertical sliding of the right-hand side sliding rise-and-fall member 32 containing GIADO motor 35B for carrying out the rotation drive of the polish implement 5B for polishes mentioned later is made possible to said guide rods 43 and 44 located in right-hand side in drawing 3 .

[0021] The sliding sleeves 37 and 37 of the pair made to attach said left-hand side sliding rise-and-fall member 31 outside said guide rods 41 and 42 besides said GIADO motor 35A respectively possible [sliding], The left-hand side tie-down plate 66 attached so that these sliding sleeves 37 and 37 and said GIADO motor 35A might be connected, It has polish implement holder 50A holding polish implement 5A for said blemish picking arranged at the U-shaped left-hand side cam lift plate 67 attached in this left-hand side tie-down plate 66, and said GIADO motor 35A bottom.

[0022] The sliding sleeves 37 and 37 of the pair made to attach said right-hand side sliding rise-and-fall member 32 outside said guide rods 43 and 44 besides said GIADO motor 35B respectively possible [sliding] on the other hand, The right-hand side tie-down plate 68 attached so that these sliding sleeves 37 and 37 and said GIADO motor 35B might be connected, It has polish implement holder 50B holding polish implement 5B for said polishes arranged at the U-shaped left-hand side cam lift plate 69 attached in this right-hand side tie-down plate 68, and said GIADO motor 35B bottom.

[0023] Said each polish implement holders 50A and 50B with which said left-hand side sliding rise-and-fall member 31 and the right-hand side sliding rise-and-fall member 32 are equipped The connecting shaft 47 with a stage fixed so that it considered as the same configuration, what is necessary might be just to refer to drawing 6 , and it might be understood, and it might rotate with the stop screw 29 at one to output-shaft 35a of said GIADO motors 35A and 35B, The sliding supporter 55 which consists of collar-like part 55b formed successively by the lower limit of drum section 55with stage a stopped by the umbrella-like head of the stop screw 54 which outer fitting of the vertical sliding of was made possible to this connecting shaft 47 by spline fitting, and was thrust into the lower part of this connecting shaft 47, and this drum section 55a, It has the coil spring 52 ****(ed) between the step of said drum section 55a in this sliding supporter 55, and the step of said connecting shaft 47, and said sliding supporter 55 is always caudad energized with said coil spring 52.

[0024] Bell shape polish implement 5 for blemish picking A and polish implement 5B for polishes are attached in the inferior-surface-of-tongue side of said collar-like part 55b of said sliding supporter 55 in the polish implement holders 50A and 50B arranged at said right and left possible [desorption] through the attachment implement 57 marketed by brand-name BEROKURO etc., respectively so that axis of rotation Oa and Ob of said polish implement holders 50A and 50B may be made into a medial-axis line.

[0025] Said polish implement 5 for blemish picking A and polish implement 5B for polishes While the abrasives for blemish picking (rough machining) and the abrasives for polishes are made to adhere, respectively and those axes of rotation Oa and Ob are perpendicularly arranged to polished surface-ed 1A of said disk 1 at the time of polish So that those base 5C is pressed against said polished surface-ed 1A from the upper part, what is necessary may be just to refer to drawing 7 and it may be understood The axes of rotation Oa and Ob are ****(ed) on the straight line which passes along the axis of rotation Oc of said turntable 20 on which said disk 1 is laid, and said revolving shaft 25 (spindle 26). And said polish implement 5 for blemish picking A and the rotation diameter Ds of polish implement 5B for polishes, Dt is made larger than the radial width of face Ls of record section 1b in recording surface (polished surface-ed) 1A of said disk 1 which should be ground, and he is trying to overflow out of non-record section 1a to which a part of the periphery section is located in the center of said disk 1, and said disk 1.

[0026] In this operation gestalt and said polish implement 5 for blemish picking A, and polish implement 5B for polishes To enable it to press against polished surface-ed 1A of said disk 1 according to an individual He is trying for said left-hand side sliding rise-and-fall member 31 equipped with said polish implement holders 50A and 50B and said right-hand side sliding rise-and-fall member 32 to attach and detach alternatively to said polished surface-ed 1A by the cam type elevator style 60.

[0027] Said cam type elevator style 60 so that in addition to drawing 3 what is necessary may be just to refer to drawing 4 and drawing 5 and they may be understood The selection dial 61 arranged by the right lateral of said up housing 12, The actuation shaft 65 cross-linking is carried out to the longitudinal direction of said up housing 12, connection immobilization of the right end section is carried out at said selection dial 61, and it was made to rotate to it and one, The click stop device 62 attached in said up housing 12 inside said selection dial 61 by the side of the right end of this actuation shaft 65, The disk cam 71 by which carry out eccentricity to a left-hand side part a little, attachment immobilization is carried out from the center section of said actuation shaft 65, and it was made for said left-hand side cam lift plate 67 of said left-hand side sliding rise-and-fall member 31 to **** to the lift side (peripheral face), To this disk cam 71, with the phase contrast of 180 degrees, carry out eccentricity to a right-hand side part a little, and attachment immobilization is carried out from the center section of said actuation shaft 65. The disk cam 72 it was made to **** to the lift side (peripheral face) is provided to said right-hand side cam lift plate 69 of said right-hand side sliding rise-and-fall member 32, and it is constituted.

[0028] In this cam type elevator style 60, whenever it turns said selection dial 61 180 degrees Said left-hand side sliding rise-and-fall member 31 and the right-hand side sliding rise-and-fall member 32 are made to descend by turns. In connection with it, said polish implement 5 for blemish picking A held at said polish implement holders 50A and 50B and said polish implement 5B for polishes By being pressed against said polished surface-ed 1A of said disk 1 by turns, and adjusting the actuation include angle of said selection dial 61 further The downward location of said said left-hand side sliding rise-and-fall member 31 and said right-hand side sliding rise-and-fall member 32, i.e., the contact pressure of said polish implements 5A and 5B to said polished surface-ed 1A of said disk 1, can be adjusted now. In addition, the condition that said polish implement 5A for blemish picking has the maximum downward location and said polish implement 5B for polishes in the maximum rise location as for drawing 3 is shown.

[0029] In addition to the above, Toride 15 with [for opening and closing it in the transverse-plane lower part] hanging section 15a is attached in said up housing 12. Hanging section 15a of this Toride 15 It is inserted and hung on stop hole 11a which he is trying to bend in the direction of inside and outside at the time of opening and closing of said up housing 12, and was prepared in the transverse-plane side edge section of top-face maintenance plate 11C of said lower housing 11. Moreover, as shown in drawing 4 , when said up housing 12 is opened by max, the buffer type stop members 79 and 79 which stop said hinge region material 14 and 14 are formed in the tooth-back upper part of said lower housing 11.

[0030] furthermore, in the periphery transverse plane of said lower housing 11 A control panel 19 is attached. To this control panel 19 The timer dial 18 grade a start switch 16, the actuation lamp 17, and for polishing time setting is arranged. In the left end section of said top-face maintenance plate 11C of said lower housing 11 As shown in drawing 2 , when said up housing 12 is shut, it is pressed by the bottom plate 12C, and the safety switch 75 with which a power circuit is switched to ON condition from an OFF condition is arranged. If said safety switch 75 is not in ON condition (i.e., if said disk cleaner 10 of this operation gestalt is not after said up housing 12 is shut completely), even if it pushes said start switch 16, said GIADO motors 35A and 35B will start it.

[0031] moreover, to said top-face plate 11C of said lower housing 11, and said internal maintenance plate 11D Many exhaust ports 13 and 13 for [which comes out when said disk 1 is polished by said polish implement 5 for blemish picking A and said polish implement 5B for polishes so that what is necessary may be just to refer to drawing 2 and drawing 3 and they may be understood] deleting and discharging dregs, the powder of abrasives, etc. in said lower housing 11, and -- are formed.

Although the above mentioned fan 100 is formed in said lower housing 11 that said shaving dregs, powder of abrasives, etc. should be attracted through said exhaust ports 13 and 13 and -- and

illustration is omitted in the back side of said lower housing 11. The filter for carrying out uptake of the powder of said shaving dregs in the air in which suction uptake was done by said fan 100, or abrasives is prepared.

[0032] In case the disk cleaner 10 of this operation gestalt considered as such a configuration is used and the blemish and dirt of a disk 1 are removed, usually the up housing 12 is opened (condition shown in drawing 2), and a disk 1 is turned on a turntable 20, the polished surface-ed 1A is turned up, it places first, and the up housing 12 is shut. then, the existence of the blemish of a disk 1 etc. shall be taken into consideration, the selection dial 61 shall be turned, and by any it shall polish between polish implement 5 for blemish picking A, and polish implement 5B for polishes -- choosing (polish implement 5B for polishes being chosen only with dirt, when there is no blemish) -- Said polish implement 5A to a disk 1 or 5B presses, the force is adjusted, further, the timer dial 18 is set suitably and a start switch 16 is pushed.

[0033] Polish implement 5A or 5B chosen by the selection dial 61 descends by this, and it is pressed against polished surface-ed 1A of a disk 1. As shown in drawing 3 and drawing 6, in the condition that the axis of rotation Oa and Ob of said polish implements 5A and 5B has been perpendicularly arranged to said polished surface-ed (1A) Polish implement 5A or 5B currently pressed against polished surface-ed 1A of a disk 1 rotates. Said disk 1 is made to rotate in connection with it by the frictional force between said polish implement 5A, or 5B and said polished surface-ed 1A. At the same time polished surface-ed 1A of a disk 1 is polished Said polish implement 5A of said disk 1, The rotation driving force by the frictional force between 5B is transmitted to said fan 100 (revolving shaft 101) through a turntable 20, a revolving shaft 25, and the fan drive wheel 90. This fan 100 is interlocked with said turntable 20 mechanically, a rotation drive is carried out, it deletes by this fan 100 and suction exclusion of dregs, the powder of abrasives, etc. is carried out from the top-face maintenance plate 11C side.

[0034] Next, if said selection dial 61 is turned about 180 degrees, said actuation is repeated and the polishing activity of the disk 1 concerned finishes in changing a use polish implement to polish implement 5B for polishes from polish implement 5 for blemish picking A, the up housing 12 will be opened, a disk 1 will be removed, and said actuation will be repeated henceforth. As mentioned above, it sets by the disk cleaner 10 of this operation gestalt. Since the axis of rotation Oa and Ob of said polish implement 5 for blemish picking A and polish implement 5B for polishes is perpendicularly arranged to said polished surface-ed 1A at the time of polish The hit of said polish implements 5A and 5B to said polished surface-ed 1A is equalized, consequently it is hard coming to generate partial wear in said polish implements 5A and 5B, and the surface smoothness of the polished surface (base 5C) of said polish implements 5A and 5B is maintained, and it is hard coming to generate faults, such as a wave, on said disk 1. In addition, since said each polish implements 5A and 5B damage polished surface-ed 1A of said disk 1 when this disk does not rotate by the press condition to said disk 1 of said polish implements 5A and 5B not being suitable etc., rotation of said polish implements 5A and 5B is controlled by the rotation detecting signal from said rotation detector 80 in the control circuit which is not illustrated.

[0035] Moreover, by having made it rotate said disk 1 according to the frictional force between said polish implements 5A and 5B and polished surface-ed 1A of said disk 1 While a result becomes beautiful as compared with the case where it is made to rotate said disk 1 (turntable 20 laid) compulsorily by a motor etc. By also being able to prevent damage on the disk 1 by the polish implements 5A and 5B, and making the polish implements 5A and 5B into the bell shape further, since the force with a disk 1 impossible for is not added The force of making a predetermined hand of cut and hard flow rotating the disk by frictional force with these polish implements 5A and 5B is also mitigable.

[0036] Since the motor for rotating a disk 1 in addition to it etc. is unnecessary, while being able to suppress the temperature rise of the disk by heat to generate, such as a motor, miniaturization of equipment, reduction of equipment cost, etc. are achieved. Moreover, so that a predetermined load may add in the direction which controls rotation of the disk 1 by the frictional force between said polish implements 5A and 5B and said polished surface-ed 1A on said disk 1 Since the fan 100 for carrying out suction exclusion of the shaving dregs of said disk 1, the powder of abrasives, etc. is interlocked with the turntable 20 on which said disk 1 is laid mechanically and the rotation drive is

made to be done Necessary frictional force can be easily acquired between said polish implements 5A and 5B and polished surface-ed 1A of said disk 1, and it becomes possible to polish the polished surface-ed of said disk 1 more effectively.

[0037] Moreover, he is trying for said two polish implement holders 50A and 50B to attach and detach alternatively on said disk 1 by the cam type elevator style 60. Since it enables it to be pressed according to an individual at polished surface-ed 1A of said disk 1, said polish implements 5A and 5B held at said polish implement holders 50A and 50B, respectively Since it becomes unnecessary to choose which shall be pressed against said disk 1 between polish implement 5A for blemish removal, and polish implement 5B for polishes, and to exchange them when performing blemish removal and a polish to said disk 1, handling becomes easy and convenience is raised.

[0038] Furthermore, since the cam type elevator style 60 enables it to be adjusted, even if the polish implements 5A and 5B wear for it out and deform the contact pressure of said polish implements 5A and 5B to polished surface-ed 1A of said disk 1 according to a polish activity, necessary can press it against said polish implements 5A and 5B, the force can be given, and removal of a blemish or dirt can be performed proper. Furthermore, since said polish implements 5A and 5B are made into the bell shape and he is trying to press the base 5C against said polished surface-ed 1A, each part of the polish implements 5A and 5B to said disk 1 presses, it is easy to be equated weak, and polished surface-ed 1A of said disk 1 can be polished much more equally.

[0039] Moreover, by making the rotation diameters Ds and Dt of said polish implements 5A and 5B larger than the radial width of face Ls of field 1b in polished surface-ed 1A of said disk 1 which should be ground All the fields in polished surface-ed 1A of said disk 1 that should be ground can be polished without requiring said polish implement 5A and 5B Reaching or moving a disk 1 in the direction of a path of this disk 1, and equipment structure and a device are simplified. furthermore, the contact surface of the polish implements [as opposed to / since said polish implements 5A and 5B are energized with a coil spring 52 at said disk 1 side at the time of polish / said disk 1] 5A and 5B -- it presses, the force is equalized and polished surface-ed 1A of said disk 1 can be polished more equally.

[0040] As mentioned above, although 1 operation gestalt of this invention was explained in full detail, this invention is not limited to said operation gestalt, is the range which does not deviate from the pneuma of invention indicated by the claim, and can perform various modification in a design. For example, although the disk cleaner 10 of said operation gestalt makes one side of 5 inches disks, such as CD, applicable to polish, it cannot be overemphasized that it can be easily designed in conformity with the same technical thought if that which made applicable to polish other disks with which it is not restricted to it but the sizes of a laser disc etc. differ, the thing which made both sides of a disk applicable to polish are these contractors.

[0041]

[Effect of the Invention] According to the disk cleaner concerning this invention, so that I may be understood from the above explanation Since the blemish and dirt with which the disk was stained can be removed proper and it was made to rotate a disk moreover according to the frictional force between a polish implement and the polished surface-ed of said disk, without making a disk produce faults, such as a wave Since the force with a disk impossible for is not added while a result becomes beautiful as compared with the case where it is made to rotate said disk (turntable laid) compulsorily by a motor etc., the effectiveness that damage on the disk 1 by the polish implement can also be prevented is acquired.

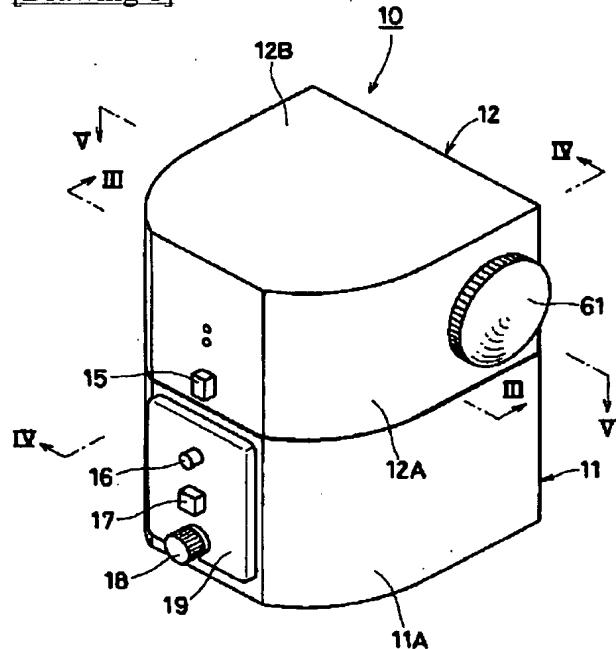
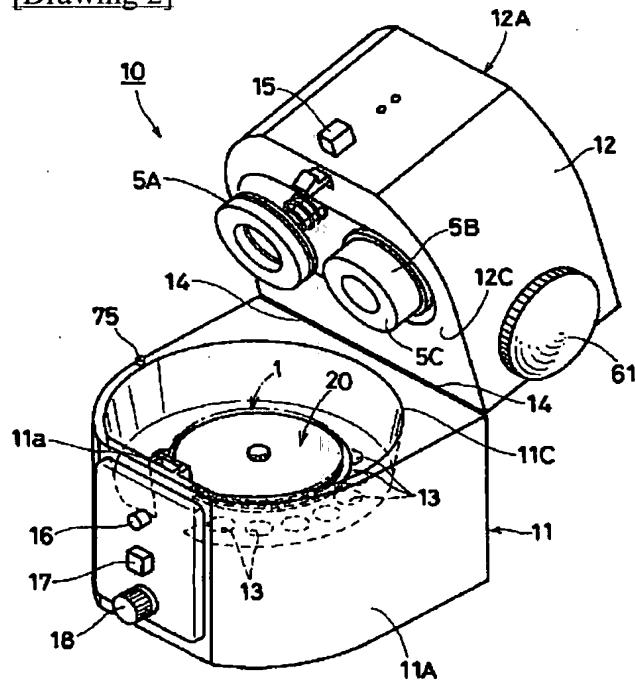
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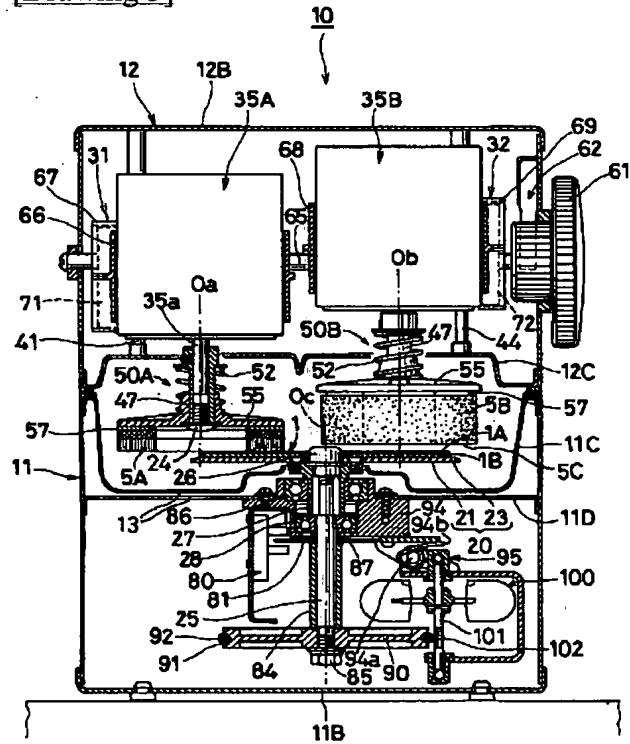
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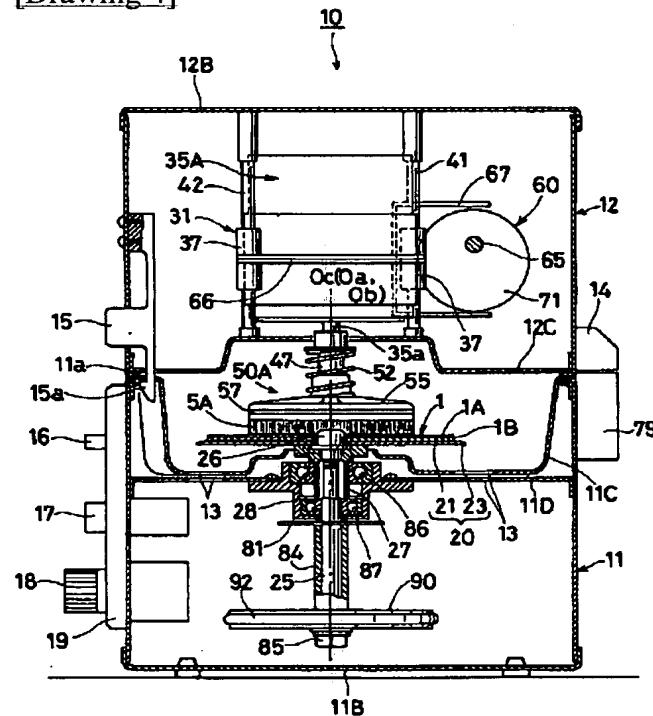
DRAWINGS

[Drawing 1]**[Drawing 2]**

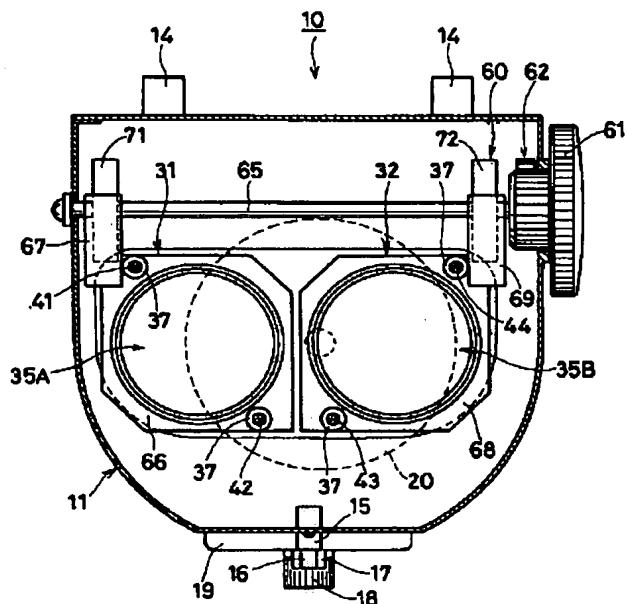
[Drawing 3]



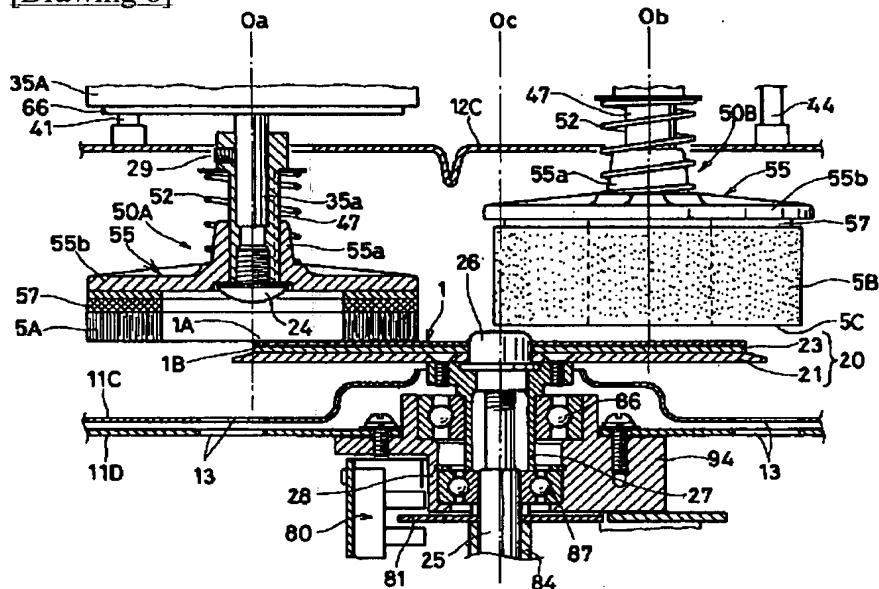
[Drawing 4]



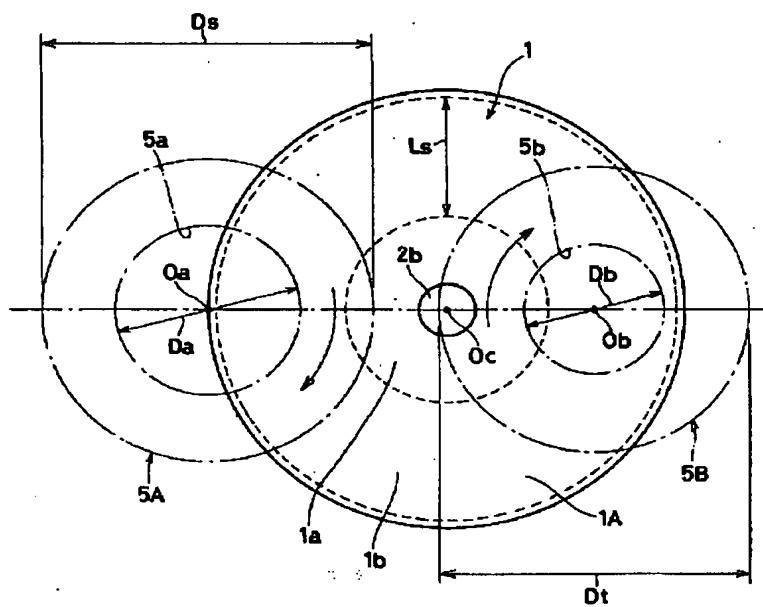
[Drawing 5]



[Drawing 6]



[Drawing 7]



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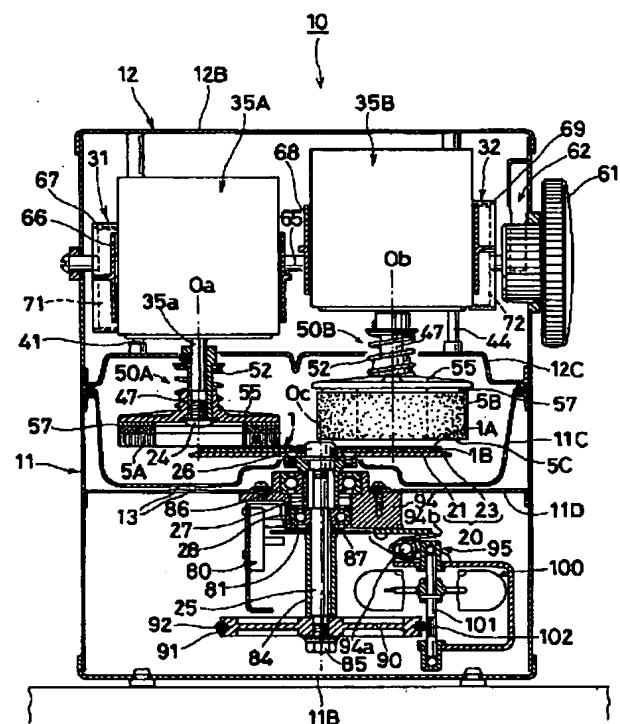
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(54) 【発明の名称】 ディスククリーナ

(57) 【要約】

【課題】 ディスクにうねり等の不具合を生じさせることなく、ディスクに付いた傷や汚れを適正に除去でき、かつ、仕上がりをより綺麗にできるディスククリーナーを提供する。

【解決手段】 ディスク（1）の被研磨面（1A）にバフ等からなる研磨具（5A、5B）を押し当て、該研磨具（5A、5B）を回転させて前記被研磨面（1A）を磨くようにされ、前記ディスク（1）の研磨時に、前記研磨具（5A、5B）の回転軸線（Oa、Ob）が前記被研磨面（1A）に対して垂直に配置され、前記研磨具（5A、5B）と前記被研磨面（1A）との間の摩擦力により前記ディスク（1）を一方向に回転させるようされてなる。



【特許請求の範囲】

【請求項1】 ディスク(1)の被研磨面(1A)にバフ等からなる研磨具(5A、5B)を押し当て、該研磨具(5A、5B)を回転させて前記被研磨面(1A)を磨くようにされたディスククリーナ(10)において、前記ディスク(1)の研磨時に、前記研磨具(5A、5B)の回転軸線(Oa、Ob)が前記被研磨面(1A)に対して垂直に配置され、前記研磨具(5A、5B)と前記被研磨面(1A)との間の摩擦力により前記ディスク(1)を一方向に回転させることを特徴とするディスククリーナ。

【請求項2】 前記研磨具(5A、5B)の少なくとも一方の前記回転軸線(Oa、Ob)が前記ディスク(1)の回転軸線(Oc)に対して径方向に所定の距離だけ離れた位置に配在されていて、前記ディスク(1)の前記被研磨面(1A)に前記研磨具(5A、5B)の一部のみが接触するようにされていることを特徴とする請求項1に記載のディスククリーナ。

【請求項3】 前記研磨具の少なくとも一方(5B)は中空円筒状とされていて、その端面(5C)を前記ディスク(1)の被研磨面(1A)に押し当てるようにされていることを特徴とする請求項1又は2に記載のディスククリーナ。

【請求項4】 前記ディスク(1)に、前記研磨具(5A、5B)と前記被研磨面(1A)との間の摩擦力による前記ディスク(1)の前記一方向への回転を抑制する方向に所定の負荷が加えられるようにされていることを特徴とする請求項1乃至3のいずれか一項に記載のディスククリーナ。

【請求項5】 前記ディスク(1)に前記負荷を加えるべく、前記ディスク(1)の削りカスや研磨材の粉等を吸引排除するためのファン(100)が、前記ディスク(1)が載置されるターンテーブル(20)の回転に連動して駆動せしめられるようにされていることを特徴とする請求項4に記載のディスククリーナ。

【請求項6】 前記ディスク(1)に対して前記研磨具(5A、5B)が上下方向に接離可能とされていることを特徴とする請求項1乃至5のいずれか一項に記載のディスククリーナ。

【請求項7】 前記被研磨面(1A)に対する前記研磨具(5A、5B)の圧接力を調節できるようにされていることを特徴とする請求項1乃至6のいずれか一項に記載のディスククリーナ。

【請求項8】 前記研磨具(5A、5B)の回転直径(Ds、Dt)が、前記ディスク(1)の前記被研磨面(1A)における研磨すべき領域(1b)の半径方向の幅(Ls)より大きくされていることを特徴とする請求項1乃至7のいずれか一項に記載のディスククリーナ。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、情報記録媒体としての光ディスクあるいは光磁気ディスク等のディスクの表面に付いた傷や汚れ等を除去するために使用されるディスククリーナに係り、特に、前記ディスクの被研磨面にバフ等からなる研磨具を押し当てて回転させることにより、前記被研磨面を磨くようにされたものに関する。

【0002】

【従来の技術】近年、音響・映像用あるいはコンピューター用の情報記録媒体として、レーザーディスク、CD(コンパクトディスク)、CD-ROM、DVD等のディスクが一般に広く普及しているが、このようなディスクにおいては、その表面、特に記録面に傷や汚れ等が付くと、見た目が悪くなるだけでなく、その傷や汚れが付いた部分の記録情報が読み取れなくなり、適正に再生できなくなる。

【0003】そのため、従来においては、クロス等を使用して手作業でディスクの傷や汚れ等を落とすようしているが、手作業では、手間及び時間がかかるとともに、傷や汚れ等を充分には除去できない。特に、中古CD店や図書館等のディスクを大量に保有し、頻繁に入替えあるいは貸出しが行われるところでは、ディスクの傷や汚れの除去に多大な労力が割かれることになるので、このディスクの傷や汚れの除去を手作業ではなく、機械的かつ自動的に行えるようにすることが強く望まれている。

【0004】このような要望に応えるべく、従来、例えば特開平7-122038号公報には、ディスクを回転させながら、そのディスクの被研磨面(記録面)にバフ等の円筒状の研磨具の周面を押し当てて、該研磨具を回転させることにより、前記被研磨面を磨くようにされたディスククリーナが提案されている。

【0005】

【発明が解決しようとする課題】しかしながら、前記提案のディスククリーナにあっては、次のような問題があった。すなわち、①前記提案のものは、ディスクの被研磨面に研磨具の周面を押し当てるようになっている。言い換えれば、前記研磨具の回転軸線が研磨時に前記被研磨面に対して平行に配置されるので、研磨具の例えば先端側は常にディスクの内周部分に、後端側は常にディスクの外周部分というようにディスクの各部分に対して研磨具の同一側周部が押し当てられることになる。この場合、ディスクの内周部分の周速度より外周部分の周速度の方が速いので、研磨具の円筒度、及び被研磨面との平行度が正確に維持されないと、ディスクの全表面にうねり等が生じやすくなる。

【0006】②ディスクを磨くにあたっては、研磨具として、荒削り用(傷除去用)のものとポリッシュ用(つや出し、仕上げ用)のものを用意しておくことが望ましい。前記提案のものは、ディスクの一つの被研磨面に対して一個の研磨具しか押し当てられていないので、傷除去用

の研磨具とボリッシュ用の研磨具とを頻繁に交換しなければならず、不便である。

【0007】④前記提案のものでは、ディスクに対する研磨具の押し当て力を調節できない。研磨具は研磨作業により摩耗、変形してくるので、押し当て力を調節できないと、研磨具に所要の押し当て力が付与されなくなり、傷や汚れの除去を適正に行えなくなるおそれがある。

④前記提案のものでは、ディスクの着脱を行う際及び研磨具の交換等を行う際に、ディスク保持用アームをディスク駆動モータと一緒にディスクの径方向（水平方向）に揺動させなければならず、取り扱いが面倒である。

【0008】⑤前記提案のものでは、前記のように研磨具の円筒度や被研磨面との平行度を正確に維持する必要があるにもかかわらず、それに対する有効な手段を講じていないので、ディスクに対する研磨具の接触面での押し当て力がばらつき、ディスクを均一に磨くことができない。本発明は、このような問題に鑑みてなされたもので、その目的とするところは、ディスクにうねり等の不具合を生じさせることなく、ディスクに付いた傷や汚れを適正に除去でき、かつ、研磨具の切り替えを簡単に行えるとともに、容易に取り扱うことができるようになされたディスククリーナを提供することにある。

【0009】

【課題を解決するための手段】前記の目的を達成すべく、本発明に係るディスククリーナは、基本的には、ディスクの被研磨面にバフ等からなる研磨具を押し当て、該研磨具を回転させて前記被研磨面を磨くようになれ、前記ディスクの研磨時には、前記研磨具の回転軸線が前記被研磨面に対して垂直に配置され、前記研磨具と前記被研磨面との間の摩擦力により前記ディスクを一方向に回転させることを特徴としている。

【0010】このような構成とされた本発明に係るディスククリーナにおいては、ディスク研磨時に、ディスクの被研磨面に対して研磨具の回転軸線を垂直に配置することにより、ディスクの被研磨面に対する研磨具の各部の当たりが均一化され、その結果、研磨具に偏摩耗が生じ難くなり、研磨具の研磨面の平坦性が維持され、ディスクにうねり等の不具合が生じ難くなる。

【0011】また、前記研磨具と前記被研磨面との間の摩擦力により前記ディスクを回転させるようにしたことにより、前記ディスク（が載置されるターンテーブル）をモーター等で強制的に回転させるようにした場合に比して、仕上がりが綺麗になるとともに、ディスクに無理な力が加わらないため、研磨具によるディスクの損傷も防止できる。それに加えて、ディスクを回転させるためのモーター等が不要であることから、モーター等の発生する熱によるディスクの温度上昇を抑えることができるとともに、装置のコンパクト化、装置コストの低減下等も図られる。

【0012】本発明の好ましい態様では、前記ディスクに、前記研磨具と前記被研磨面との間の摩擦力によるディスクの回転を抑制する方向に所定の負荷が加えられるようされ、より具体的な好ましい態様では、前記ディスクに前記負荷を加えるべく、前記ディスクの削りカスや研磨材の粉等を吸引排除するためのファンが、前記ディスクが載置されるターンテーブルの回転に連動して駆動せしめられるようされる。

【0013】このようにされることにより、前記研磨具と前記ディスクの被研磨面1Aとの間に所定の摩擦力を容易に付与することができ、前記ディスクの被研磨面をより効果的に磨くことが可能となる。また、本発明に係るディスククリーナでは、好ましくは、前記ディスクに対して前記研磨具が上下方向に接離可能とされ、さらに、前記被研磨面に対する前記研磨具の圧接力を調節できるようされる。

【0014】これにより、研磨具が研磨作業により摩耗、変形しても、研磨具に所要の押し当て力を付与でき、傷や汚れの除去を適正に行える。他の好ましい態様では、前記研磨具の少なくとも一方は中空円筒状とされていて、その端面を前記ディスクの被研磨面に押し当てるようされる。これにより、ディスクに対する研磨具の各部の押し当て力、当たり等が均等化されやすくなり、ディスクの被研磨面を一層均等に磨くことができ、さらに、中空円筒状とされていることによって、研磨具との摩擦力によるディスクを所定回転方向と逆方向に回転させる力を軽減することもできる。

【0015】また、他の好ましい態様では、前記研磨具の少なくとも一方の前記回転軸線が前記ディスクの回転軸線に対して径方向に所定の距離だけ離れた位置に配在せしめられていて、前記ディスクの前記被研磨面に前記研磨具の一部のみが接触するようされ、さらに好ましい態様では、前記研磨具の回転直径が、前記ディスクの前記被研磨面における研磨すべき領域の半径方向の幅より大きくなる。これにより、研磨具及び又はディスクをディスクの径方向に移動させることを要しないでディスクの被研磨面における研磨すべき全領域を磨くことができ、装置構造・機構が簡素化される。

【0016】

【発明の実施の形態】以下、本発明の実施の形態を図面を参照しつつ説明する。図1は本発明に係るディスククリーナの一実施形態の外形を示している。図示実施形態のディスククリーナ10は、CD等の5インチのディスクを研磨対象としたもので、下部ハウジング11と、この下部ハウジング12に対して背面側に設けられたヒンジ部材14、14（図2、図4参照）を支点として、上方に開くことができるようされた上部ハウジング12（図2は最大に開いた状態を示す）と、を有し、前記下部ハウジング11は、図3～図5をも参照すればよくわかるように、半楕円形の側周板11Aと、底板11B

と、台形凹部を有する上面板11Cと、内部保持板11Dとからなり、また、前記上部ハウジング12は、半楕円形の側周板12Aと、天板12Bと、逆台形凹部を有する底板12Cと、からなっている。

【0017】前記下部ハウジング11内には、前記内部保持板11Dに保持スリーブ28を介して回転軸25が垂直に保持されており、この回転軸25の上端部にスピンドル26が螺合固定されている。該スピンドル26は前記上面板11Cの上方に突出せしめられ、このスピンドル26に、テーブル保持部材27を介して、ディスク(CD)1がその記録面(被研磨面)1Aを上にし非記録面(ラベル面)1Bを下にした状態で載置される、基板21及びゴム板23からなるターンテーブル20が取付固定されている。また、前記テーブル保持部材27と前記回転軸25との間にはスラストにも対応できるボールベアリング86、87が配置されている。

【0018】前記回転軸25における前記下側のボールベアリング87の下側には、前記ターンテーブル20の回転数を検出すべく、例えば等角度間隔で所定数のスリットが形成されている回転検出円板81が一体回転自在に配置され、この回転検出円板81の一側方に該回転検出円板81の回転数を検出するホールIC等の回転検出器80が配設されている。また、前記回転軸25における前記回転検出円板81の下側には、筒状スペーサ84及びファン駆動ホイール90が外嵌せしめられ、前記回転検出円板81、前記筒状スペーサ84、及び、前記ファン駆動ホイール90は、前記回転軸25の下端部に螺合せしめられたナット85により前記回転軸25と一体回転するように締め付け固定されている。

【0019】前記ファン駆動ホイール90の外周溝部91には、ゴム等の弾性材料からなる弾性リング92が弾性的に張嵌せしめられた状態で外嵌されている。このファン駆動ホイール90の側方には、前記内部保持板11Dに固着された取付部材94に枢止軸94aを介して保持された支持部材95に回転自在に支持されたファン100が配設されている。該ファン100は、後述する如くに、前記ディスクDの削りカスや研磨材の粉等を吸引排除するためのもので、その回転軸101には、前記ファン駆動ホイール90の前記弾性リング92が適度に食い込むように、前記枢止軸94aの回りに配設された不勢ばね94bの押圧力により圧接せしめられるセレーション歯の如き噛合部102が形成されている。

【0020】したがって、前記ファン100は、前記ターンテーブル20が回転せしめられると、その回転駆動力が前記回転軸25及び前記ファン駆動ホイール90を介してその回転軸102に伝達され、それによって回転駆動せしめられる。一方、前記上部ハウジング12内には、前記天板12Bと前記底板12Cとを橋絡するように垂直に四本のガイドロッド41、42、43、44が配設されている。これらのガイドロッド41～44のう

ち、図3において左側に位置する前記ガイドロッド41、42には、後述する傷取り(荒削り)用の研磨具5Aを回転駆動するためのギアードモータ35Aを含む左側摺動昇降部材31が上下摺動可能に支持案内され、図3において右側に位置する前記ガイドロッド43、44には、後述するポリッシュ用の研磨具5Bを回転駆動するためのギアードモータ35Bを含む右側摺動昇降部材32が上下摺動可能に支持案内される。

【0021】前記左側摺動昇降部材31は、前記ギアードモータ35Aの他、前記ガイドロッド41、42にそれぞれ摺動可能に外嵌せしめられた一対の摺動スリーブ37、37と、これらの摺動スリーブ37、37と前記ギアードモータ35Aとを連結するように取り付けられた左側取付板66と、この左側取付板66に取り付けられたコ字状の左側カムリフト板67と、前記ギアードモータ35Aの下側に配置された前記傷取り用の研磨具5Aを保持する研磨具保持具50Aと、を備えている。

【0022】一方、前記右側摺動昇降部材32は、前記ギアードモータ35Bの他、前記ガイドロッド43、44にそれぞれ摺動可能に外嵌せしめられた一対の摺動スリーブ37、37と、これらの摺動スリーブ37、37と前記ギアードモータ35Bとを連結するように取り付けられた右側取付板68と、この右側取付板68に取り付けられたコ字状の左側カムリフト板69と、前記ギアードモータ35Bの下側に配置された前記ポリッシュ用の研磨具5Bを保持する研磨具保持具50Bと、を備えている。

【0023】前記左側摺動昇降部材31及び右側摺動昇降部材32に備えられる前記各研磨具保持具50A、50Bは、同一構成とされていて、図6を参照すればよくわかるように、前記ギアードモータ35A、35Bの出力軸35aに止めネジ29により一体に回転するように固定された段付き連結軸47と、この連結軸47にスライドイン嵌合により上下摺動可能に外嵌され、該連結軸47の下部に螺入された止めネジ54の傘状頭部に係止される段付き胴部55a及びこの胴部55aの下端に連設された鍔状部55bとからなる摺動保持体55と、該摺動保持体55における前記胴部55aの段部と前記連結軸47の段部との間に縮装されたコイルバネ52とを、備えており、前記摺動保持体55は、前記コイルバネ52により常時下方に付勢されている。

【0024】前記左右に配置された研磨具保持具50A、50Bにおける前記摺動保持体55の前記鍔状部55bの下面側には、前記研磨具保持具50A、50Bの回転軸線Oa、Obを中心軸線とするように、それぞれ中空円筒状の傷取り用研磨具5A、ポリッシュ用研磨具5Bが、例えば商標名ベロクロ等で市販されている取着具57を介して脱着可能に取り付けられている。

【0025】前記傷取り用研磨具5A及びポリッシュ用研磨具5Bは、それぞれ傷取り(荒削り)用の研磨材、

ポリッシュ用の研磨材が付着せしめられており、それらの回転軸線O a, O bが、研磨時に前記ディスク1の被研磨面1 Aに対して垂直に配置されるとともに、それらの底面5 Cが前記被研磨面1 Aに上方から押し当てられるようになっていて、図7を参照すればよくわかるように、その回転軸線O a, O bが、前記ディスク1が載置される前記ターンテーブル2 0及び前記回転軸2 5（スピンドル2 6）の回転軸線O cを通る一直線上に配在され、かつ、前記傷取り用研磨具5 A及びポリッシュ用研磨具5 Bの回転直径D s、D tが、前記ディスク1の記録面（被研磨面）1 Aにおける研磨すべき記録領域1 bの半径方向の幅L sより大きくされていて、その外周部の一部が前記ディスク1の中央に位置する非記録領域1 a及び前記ディスク1外にはみ出すようにされている。

【0026】そして、本実施形態においては、前記傷取り用研磨具5A及びポリッシュ用研磨具5Bを、前記ディスク1の被研磨面1Aに個別に押し当てるができるようすべく、前記研磨具保持具50A、50Bを備えた前記左側摺動昇降部材31及び前記右側摺動昇降部材32が、カム式昇降機構60により前記被研磨面1Aに対して選択的に接離するようになっている。

【0027】前記カム式昇降機構60は、図3に加えて図4及び図5を参照すればよくわかるように、前記上部ハウジング12の右側面に配設された選択ダイヤル61と、前記上部ハウジング12の左右方向に橋架されその右端部が前記選択ダイヤル61に連結固定されて、それと一体に回転するようにされた操作シャフト65と、該操作シャフト65の右端側における前記選択ダイヤル61より内側の前記上部ハウジング12内に取り付けられたクリックストップ機構62と、前記操作シャフト65の中央部より若干左側部分に偏心して取着固定され、前記左側摺動昇降部材31の前記左側カムリフト板67にそのリフト面(外周面)が摺接するようにされた円板カム71と、この円板カム71に対して180度の位相差をもって前記操作シャフト65の中央部より若干右側部分に偏心して取着固定され、前記右側摺動昇降部材32の前記右側カムリフト板69にそのリフト面(外周面)が摺接するようにされた円板カム72と、を具備して構成されている。

【0028】かかるカム式昇降機構60においては、前記選択ダイヤル61を180度回す毎に、前記左側摺動昇降部材31と右側摺動昇降部材32とが交互に下降せしめられ、それに伴って、前記研磨具保持具50A、50Bに保持された前記傷取り用研磨具5A及び前記ポリッシュ用研磨具5Bが、前記ディスク1の前記被研磨面1Aに交互に押し当てられ、さらに、前記選択ダイヤル61の操作角度を加減することにより、前記前記左側摺動昇降部材31と前記右側摺動昇降部材32の下降位置、つまり、前記ディスク1の前記被研磨面1Aに対する前記研磨具5A、5Bの圧接力を調節できるようにな

っている。なお、図3は、前記傷取り用研磨具5Aが最下降位置、前記ポリッシュ用研磨具5Bが最上昇位置にある状態が示されている。

【0029】以上に加え、前記上部ハウジング12には、その正面下部にそれを開け閉めするための掛止部15a付きの取手15が取り付けられ、該取手15の掛け止部15aは、前記上部ハウジング12の開け閉め時にその内外方向に撓むようにされていて、前記下部ハウジング11の上面保持板11Cの正面側端部に設けられた係

10 止穴11aに挿入されて掛止されるようになっている。また、前記下部ハウジング11の背面上部には、図4に示される如くに、前記上部ハウジング12が最大に開かれたとき、前記ヒンジ部材14、14を係止する緩衝式係止部材79、79が設けられている。

【0030】さらに、前記下部ハウジング11の外周正面には、操作パネル19が取り付けられ、該操作パネル19には、起動スイッチ16、作動ランプ17、磨き時間設定用のタイマーダイヤル18等が配設され、また、前記下部ハウジング11の前記上面保持板11Cの左端

20 部には、図2に示される如くに、前記上部ハウジング12が閉められたときその底板12Cにより押圧されて、電源回路がOFF状態からON状態に切り換えられる安全スイッチ75が配設されている。本実施形態の前記ディスククリーナ10は、前記安全スイッチ75がON状態でないと、つまり、前記上部ハウジング12が完全に閉められた後でないと、前記起動スイッチ16を押しても前記ギアードモータ35A、35Bが起動しないようになっている。

30 【0031】また、前記下部ハウジング11の前記上面板11C及び前記内部保持板11Dには、図2及び図3を参照すればよくわかるように、前記ディスク1を前記傷取り用研磨具5A及び前記ポリッシュ用研磨具5Bで磨いた際に出て来る削りカスや研磨材の粉等を前記下部ハウジング11内に排出するための多数の排出口13、13、…が形成されており、前記下部ハウジング11内には、前記削りカスや研磨材の粉等を前記排出口13、13、…を通じて吸引すべく、前記したファン100が設けられ、前記下部ハウジング11の背後面には、図示は省略されているが、前記ファン100により吸引捕集40された空気中の前記削りカスや研磨材の粉を捕集するためのフィルタが設けられている。

【0032】このような構成とされた本実施形態のディスククリーナ10を使用して、ディスク1の傷や汚れを除去する際には、通常、まず、上部ハウジング12を開け（図2に示される状態）、ターンテーブル20上にディスク1をその被研磨面1Aを上にして置き、上部ハウジング12を閉める。 続いて、ディスク1の傷の有無等を勘案して、選択ダイヤル61を回して傷取り用研磨具5A及びポリッシュ用研磨具5Bのいずれで磨くのかを選択する（汚れだけで傷が無い場合はポリッシュ用研

磨具5Bを選択する)とともに、ディスク1に対する前記研磨具5A又は5Bの押し当て力を調節し、さらに、タイマーダイヤル18を適宜にセットして起動スイッチ16を押す。

【0033】これにより、選択ダイヤル61により選択された研磨具5A又は5Bが下降してディスク1の被研磨面1Aに押し当てられ、図3、図6に示される如くに、前記研磨具5A、5Bの回転軸線Oa、Obが前記被研磨面(1A)に対して垂直に配置された状態で、ディスク1の被研磨面1Aに押し当てられている研磨具5A又は5Bが回転し、それに伴い、前記研磨具5A又は5Bと前記被研磨面1Aとの間の摩擦力により前記ディスク1が回転せしめられ、ディスク1の被研磨面1Aが磨かれると同時に、前記ディスク1の前記研磨具5A、5Bとの間の摩擦力による回転駆動力が、ターンテーブル20、回転軸25、ファン駆動ホイール90を介して前記ファン100(の回転軸101)に伝達され、該ファン100が前記ターンテーブル20に機械的に連動して回転駆動せしめられ、該ファン100により削りカスや研磨材の粉等が上面保持板11C側から吸引排除される。

【0034】次に、使用研磨具を傷取り用研磨具5Aからポリッシュ用研磨具5Bに替える場合には、前記選択ダイヤル61を約180度回して前記操作を繰り返し、当該ディスク1の磨き作業が終われば、上部ハウジング12を開けてディスク1を取り出し、以後、前記操作を繰り返す。前記のように、本実施形態のディスククリーナ10においては、前記傷取り用研磨具5A及びポリッシュ用研磨具5Bの回転軸線Oa、Obが、研磨時に前記被研磨面1Aに対して垂直に配置されるので、前記被研磨面1Aに対する前記研磨具5A、5Bの当たりが均一化され、その結果、前記研磨具5A、5Bに偏摩耗が生じ難くなり、前記研磨具5A、5Bの研磨面(底面5C)の平坦性が維持され、前記ディスク1にうねり等の不具合が生じ難くなる。なお、前記研磨具5A、5Bの前記ディスク1への押圧状態が適切でない等で、該ディスクが回転しない場合には、前記各研磨具5A、5Bが前記ディスク1の被研磨面1Aを傷付けてしまうので、前記回転検出器80からの回転検出信号によって、図示しない制御回路で、前記研磨具5A、5Bの回転を制御する。

【0035】また、前記研磨具5A、5Bと前記ディスク1の被研磨面1Aとの間の摩擦力により前記ディスク1を回転させるようにしたことにより、前記ディスク1(が載置されるターンテーブル20)をモーター等で強制的に回転させるようにした場合に比して、仕上がりが綺麗になるとともに、ディスク1に無理な力が加わらないため、研磨具5A、5Bによるディスク1の損傷も防止でき、さらに、研磨具5A、5Bが中空円筒状とされていることによって、該研磨具5A、5Bとの摩擦力に

によるディスクを所定回転方向と逆方向に回転させる力を軽減することもできる。

【0036】それに加えて、ディスク1を回転させるためのモーター等が不要であることから、モーター等の発生する熱によるディスクの温度上昇を抑えることができるとともに、装置のコンパクト化、装置コストの低減等も図られる。また、前記ディスク1に、前記研磨具5A、5Bと前記被研磨面1Aとの間の摩擦力によるディスク1の回転を抑制する方向に所定の負荷が加えるべく、前記ディスク1の削りカスや研磨材の粉等を吸引排除するためのファン100が、前記ディスク1が載置されるターンテーブル20に機械的に連動して回転駆動せしめられるようにされているので、前記研磨具5A、5Bと前記ディスク1の被研磨面1Aとの間に所要の摩擦力を容易に得ることができて、前記ディスク1の被研磨面をより効果的に磨くことが可能となる。

【0037】また、前記二個の研磨具保持具50A、50Bがカム式昇降機構60により前記ディスク1に対して選択的に接離するようにされていて、前記研磨具保持具50A、50Bにそれぞれ保持された前記研磨具5A、5Bを、前記ディスク1の被研磨面1Aに個別に押し当てることができるようにされているので、前記ディスク1に対して傷除去とポリッシュとを行う場合に、傷除去用の研磨具5Aとポリッシュ用の研磨具5Bのどちらを前記ディスク1に押し当てるかを選択するだけで済み、それらを交換する必要がなくなるので、取り扱いが容易となり、利便性が高められる。

【0038】さらに、前記ディスク1の被研磨面1Aに対する前記研磨具5A、5Bの圧接力をカム式昇降機構60により調節できるようにされているので、研磨具5A、5Bが研磨作業により摩耗、変形しても、前記研磨具5A、5Bに所要の押し当て力を付与でき、傷や汚れの除去を適正に行える。またさらに、前記研磨具5A、5Bが中空円筒状とされていてその底面5Cを前記被研磨面1Aに押し当てるようになっているので、前記ディスク1に対する研磨具5A、5Bの各部の押し当て力等が均等化されやすくなり、前記ディスク1の被研磨面1Aを一層均等に磨くことができる。

【0039】また、前記研磨具5A、5Bの回転直径Ds、Dtが、前記ディスク1の被研磨面1Aにおける研磨すべき領域1bの半径方向の幅Lsより大きくされていることにより、前記研磨具5A、5B及び又はディスク1を該ディスク1の径方向に移動させることを要しないで前記ディスク1の被研磨面1Aにおける研磨すべき全領域を磨くことができ、装置構造・機構が簡素化される。さらに、前記研磨具5A、5Bが研磨時にコイルバネ52により前記ディスク1側に付勢されるようになっているので、前記ディスク1に対する研磨具5A、5Bの接触面での押し当て力が均一化され、前記ディスク1の被研磨面1Aをより均等に磨くことができる。

【0040】以上、本発明の一実施形態について詳述したが、本発明は、前記実施形態に限定されるものではなく、特許請求の範囲に記載された発明の精神を逸脱しない範囲で、設計において、種々の変更ができるものである。例えば、前記実施形態のディスククリーナ10は、CD等の5インチのディスクの片面を研磨対象としたものであるが、それに限らずレーザーディスク等のサイズの異なる他のディスクを研磨対象としたものや、ディスクの両面を研磨対象としたもの等も、当業者なら同一技術思想に則って容易に設計できることはいうまでもない。

【0041】

【発明の効果】以上の説明から理解されるように、本発明に係るディスククリーナによれば、ディスクにうねり等の不具合を生じさせることなく、ディスクに付いた傷や汚れを適正に除去でき、しかも、研磨具と前記ディスクの被研磨面との間の摩擦力によりディスクを回転させるようにしたので、前記ディスク（が載置されるターンテーブル）をモーター等で強制的に回転させるようにした場合に比して、仕上がりが綺麗になるとともに、ディスクに無理な力が加わらないため、研磨具によるディスク1の損傷も防止できるといった効果が得られる。

【図面の簡単な説明】

【図1】本発明に係るディスククリーナー実施形態の外*

* 観を示す斜視図。

【図2】図1に示されるディスククリーナの上部ハウジングを開けた状態を示す斜視図。

【図3】図1のIII-III矢視断面図。

【図4】図1のIV-IV矢視断面図。

【図5】図1のV-V矢視断面図。

【図6】図3に示される研磨具保持具周辺の拡大断面図。

【図7】図1に示されるディスククリーナの研磨具とディスクとの配置関係等を示す図。

【符号の説明】

1 ディスク (CD)

1A 被研磨面

1B 研磨すべき領域

5A 傷取り用研磨具

5B ポリッシュ用研磨具

10 ディスククリーナ

20 ターンテーブル

100 ファン

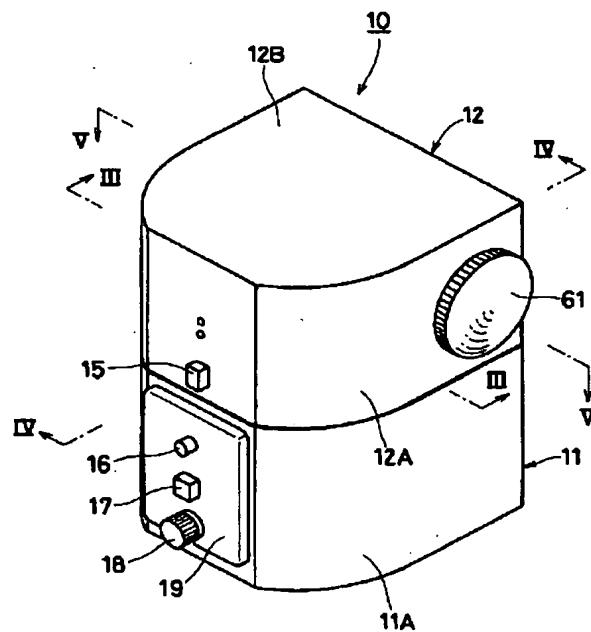
Oa, Ob 研磨具の回転軸線

Ds, Dt 研磨具の回転直径

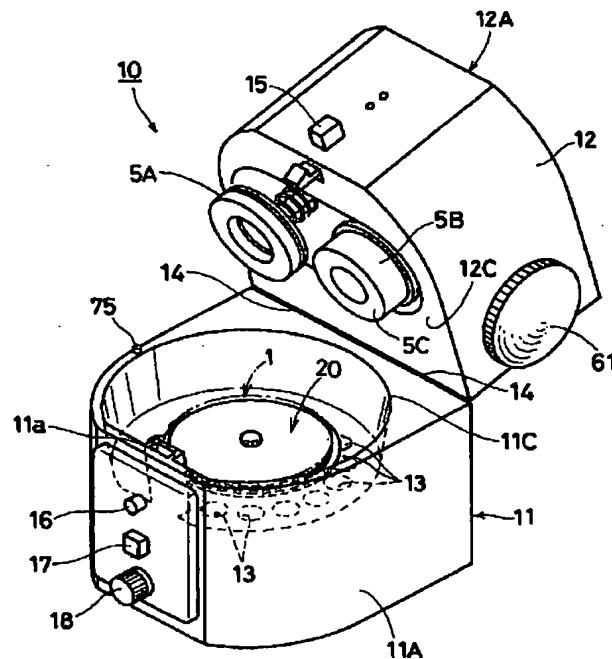
Ls 研磨すべき領域の半径方向の幅

Oc ディスクの回転軸線

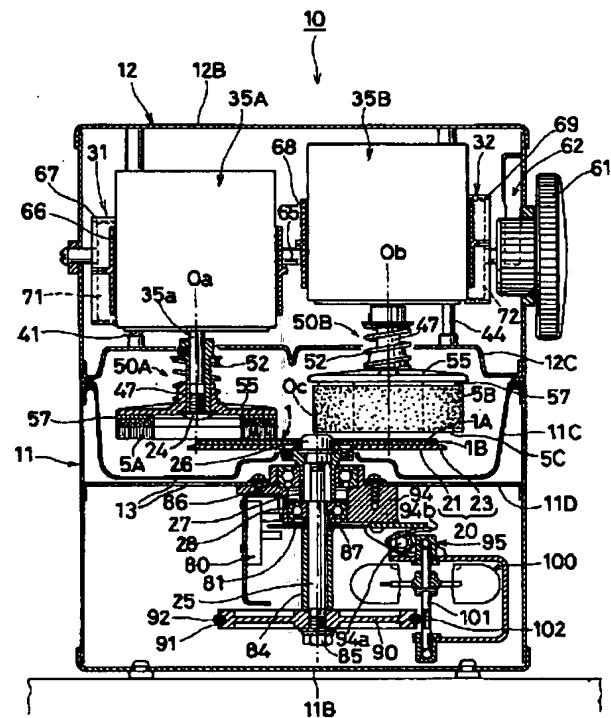
【図1】



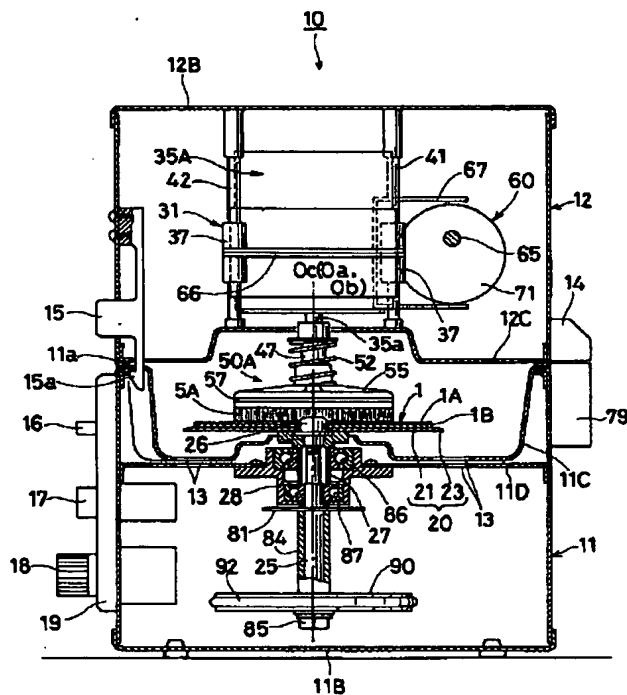
【図2】



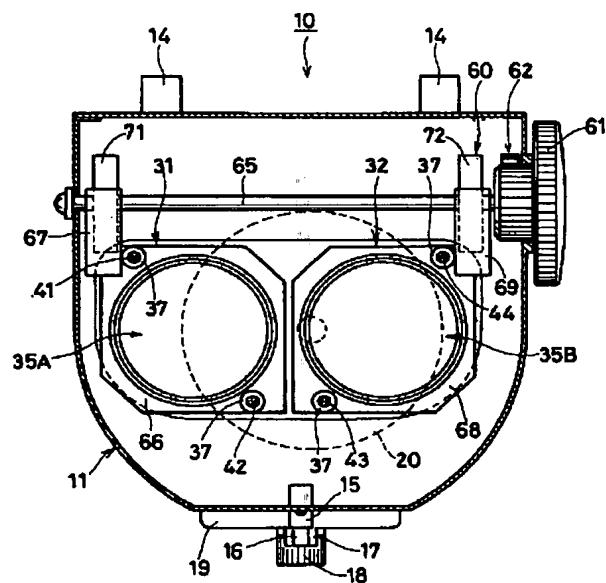
【图3】



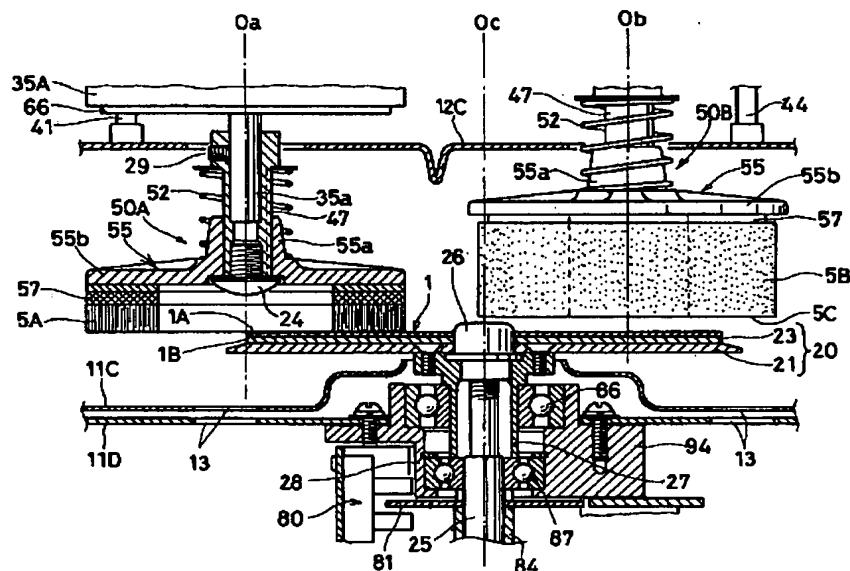
【図4】



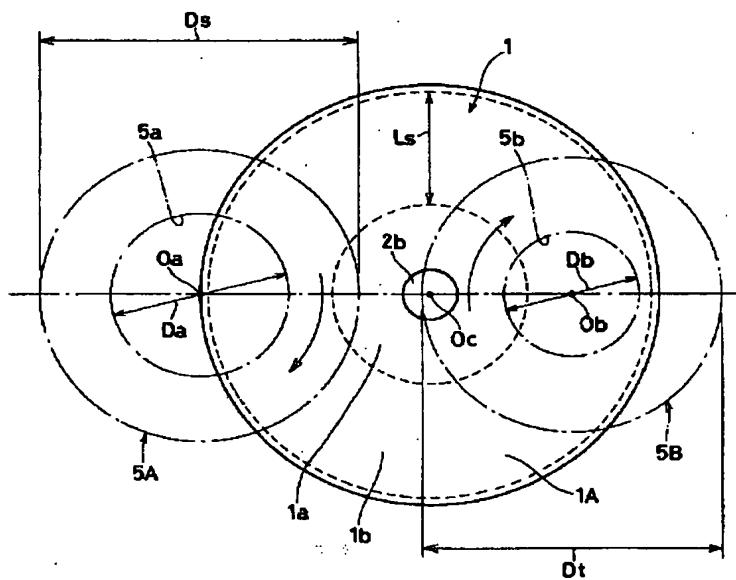
【 5】



【図6】



【图7】



フロントページの続き

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